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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,408	04/22/2005	Kaoru Masuda	270621US0PCT	9133

22850 7590 02/12/2007  
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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KORNAKOV, MICHAEL

ART UNIT	PAPER NUMBER
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1746

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/532,408

Applicant(s)

MASUDA ET AL.

Examiner

Michael Kornakov

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,7 and 8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,7,8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Applicants' amendment dated 12/01/2006 is acknowledged. Claims 1,3,7,8 are currently pending and examined on the merits.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1, 3, 7, 8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Castrucci (U.S. 6,521,466).

Castrucci discloses a method of cleaning a resist residue from the semiconductor wafer surface comprising fluidizing a cleaning composition under supercritical conditions and contacting the resist residue with the cleaning composition, wherein said cleaning composition is formed from carbon dioxide under the pressure of 1050 -10000 psi (reads on "a pressure of 5 Mpa or more", as claimed) and specific co-solvent that is used for specific cleaning (stripping of resist is particularly indicated in col. 9, line 50) in the amount of 0.001-15% by mass. Among the specific co-solvents hydrogen fluoride is named (see col.3, lines 35-65). Castrucci utilizes his recipes for the removal of fluorinated residues (col.8, lines 54-55), which are also known to be the photoresist residues from fluorinated polymer made photoresists. With regard to claim 7, the mixture of hydrofluoric acid and alcohol is allowed by the recipes of Castrucci (col.8, lines 38-55). With specific regard to claims 3 and 8, the co-solvent, such as hydrofluoric acid, is introduced (mixed) into the stream of supercritical carbon dioxide (col. 8, lines 38-40). The teaching of Castrucci does not specifically indicate that the water content in

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the cleaning composition is controlled to 0.0001 to 0.5% by mass. However, since the instant disclosure does not clarify how and at what stage of cleaning such controlling is effected, it is assumed that water in the indicated content is included into the cleaning composition. It is also noted that co-solvents of high purity or so called electronic purity are conventionally utilized in the art for processing/cleaning of semiconductors. It is also noted that water in trace amounts is present in such high purity solvents, as evidenced, for example by U.S. 5,022,961, col. 8, lines 61-53, or by Product Specifications of Hydrogen Fluoride. Both references are provided only to show that the characteristic recited in claims is present within the teaching of Castrucci.

The teaching of Castrucci differs from the instant claims by not disclosing a specific embodiment that embraces all the components of the instant claims, but rather providing a generic teaching of the recipes for removing residues from substrates. However, Castrucci clearly motivates those skilled in the art to utilize recipes SPECIFIC for each particular residue, and clearly names HF among only 9 other species.

Therefore, since Castrucci teaches removing a fluorinated residue, since it is well known by those skilled in the art that conventional photoresist can be made of fluorinated polymers, and since the conventional wisdom states that "like dissolves like", then it would have been obvious to those skilled in the art to choose HF or the mixture of HF and alcohol as allowed by the recipes of Castrucci, mixed with supercritical carbon dioxide as suggested by Castrucci to remove the fluorinated resist residue and thus to arrive at the instant claims.

***Response to Arguments***

4. Applicant's arguments filed 12/01/2006 have been fully considered but they are not persuasive. Applicants argue that "Castrucchi disclose a variety of chemical components of a cleaning agent composition. Water is not one of those components. Accordingly, the claimed methods are not obvious over that reference." This is not found persuasive, since water in the recited content is present within the teaching of Castrucci, the evidence of which is provided in this Office Action.

***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael Kornakov  
Primary Examiner  
Art Unit 1746

02/07/2007